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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/622,354	07/18/2003	Joseph F. Bringley	85688PAL	4823

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EXAMINER

METZMAIER, DANIEL S

ART UNIT	PAPER NUMBER
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1712

DATE MAILED: 02/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/622,354

Applicant(s)

BRINGLEY, JOSEPH F.

Examiner

Daniel S. Metzmaier

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 7/18/2003; 12/24/2004; & 11/7/2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-35 is/are pending in the application.
- 4a) Of the above claim(s) 1-27 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 28-35 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>7/18/03 & 12/27/04</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claims 1-35 are pending. Claims 1-27 have been withdrawn from further consideration.

Election/Restrictions

1. Applicant's election with traverse of the restriction and election of species in the reply filed on November 7, 2005 is acknowledged. The traversal is on the ground(s) that follow. Applicants assert neither the independent method claim or the independent composition claim require latex and the examiner has not shown how one would make the compositions without making a dispersion.

This is not found persuasive because the search for latex is not required for any of the method steps per se. The compositions require a search and examination of compositions that specifically require latex as an alternative (see claim 32).

Additionally, the compositions require an aqueous medium, which is not required in all of the method claims, i.e., the method claims read on other than aqueous dispersing media.

Furthermore, the particles of the composition claims do not require that said particles be made in the dispersed state but may be dispersed as a final step after the core-shell structure has been formed. Said non-limiting methods of forming the core-shell structure include granulation methods including spray drying, spraying solid particles with a coating agent, or the use of a fluidized bed of coating said particles.

Lastly, no single method claim requires all the limitations of the independent composition claim 28.

Applicants further traverse the election of species by stating that the search for the species overlap and a search for said species would be best examined in a single application based on the premise of compact prosecution. This has not been deemed persuasive due to the diverse nature of the species required for each of the core, shell and dispersing media.

Said election is based on a burdensome search and examination of the numerous species disclosed and generically claimed. Attention is directed to the list at page 5, lines 5 et seq; wherein the core may be selected from the subgenus selected from metals, metal (hydrous) oxides, insoluble metal salts, organic particulates and insoluble (unspecified) polymers. The shell materials may be organic or inorganic materials including "covalently bonded molecules", polymers, biopolymers, oxides, and particulate materials. These may be the compounds that are also disclosed as the core materials, bio-polymers, and particulates having possible utility in bio-medical utilities, drug-delivery, or bio-recognition. The dispersing media can be aqueous or non-aqueous including water, C₁₋₄ alcohols, chlorinated organic solvents, benzene or toluene.

To the extent the bio-polymers are claimed, said material may control the classification and require a search in the medical, bio-affecting, or testing composition areas. The organic polymer compositions may require a search in the polymer classes, such as class 520+, while the inorganic materials require divergent searches in the colloidal area based on the dispersing media and/or the materials forming said dispersion.

Applicants' conclusion that the species overlap is without basis and contrary to the facts herein requiring searched in various areas. Furthermore, the use of the diverse species would require different surface reactions of the core particle reactive groups with the shell material surface groups. To examine said diverse reactions and possible permutations thereof would require a burdensome search and examination on the Office for all possible species generically claimed and disclosed.

The requirement is still deemed proper and is therefore made FINAL.

2. Claims 1-27 have been withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on November 7, 2005. Claims 28-35 are generic the elected species and have been examined only to the extent said claims read on the elected species.

Applicants' election consist of: (1) core = colloidal silica; (2) shell = zirconia; and (3) dispersing media = water.

Specification

3. The disclosure is objected to because of the following informalities: the specification contains several Tables, i.e., 2-4. To the extent the table set forth on page 9 is "Table 1", it is not so defined. Attention is further directed to page 10, lines 2 and 3, which reference "Table 1".

4. The use of the trademarks has been noted in this application. They should be capitalized wherever it appears and be accompanied by the generic terminology.

Although the use of trademarks is permissible in patent applications, the proprietary nature of the marks should be respected and every effort made to prevent their use in any manner, which might adversely affect their validity as trademarks.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

6. Claims 28-35 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 28 is indefinite because the metes and bounds of applicants' claims are unclear due to the use of varying scope transitional language. Claim 28 defines the "solid consist of core-shell particles" and sets forth "said core-shell particles comprises".

Furthermore, the scope of the limitation "the particulate material is present in an amount sufficient, and only sufficient, to cover the surfaces of all core particles". Applicants describe said limitation with a range (see above written description rejection) rather than a specified amount as claimed. It is unclear what applicants intend as the metes and bounds of said limitation.

Claim 34 lacks proper antecedent basis because it is unclear what "said particulate particles" are referenced. The core-shell material is described as particles and the core-shell particles comprise a particulate material to cover all core particles. It

is unclear whether applicants are referencing the core particles, core-shell particles, or the shell particles.

Claim 28 requires a core-shell particle structure dispersed in aqueous medium, wherein said core-shell particles comprise a particulate material "in an amount sufficient and only sufficient to cover all of the core particles". The metes and bounds of said limitation are indefinite and due to numerous inconsistencies in defining said limitation.

Applicants describe (page 7 to page 8, lines 26 to 13) the determination of said "amount sufficient, and only sufficient, to cover the core particles" may be approximated by determining the ratio of the projected area of the shelling particles ($1/4\pi d^2$ / g, circular cross section / unit mass) to the total surface area of the core (πd^2 / g, spherical surface area / unit mass). Said ratio is characterized as 0.7 to 1.5, preferably 0.8 to 1.2.

Initially, it is unclear what is the scope of "an amount sufficient, and only sufficient to cover the core particles" since applicants set forth a range and a preferred range of amounts.

Furthermore, applicants define (page 5, lines 17 et seq of the instant specification) the shell materials include organic or inorganic materials including "covalently bonded molecules", polymers, biopolymers, oxides, and particulate materials. It is unclear how one skilled in the art would determine the proper amount of shelling material for said materials disclosed that are other than particulate. An example would include those compounds that are "covalently-bonded molecules". These are disclosed alternative to particulate materials and would clearly be interpreted

to include non-particulate molecules. To the extent said molecules are based on the molecular size, applicants have not so stated.

Applicants characterize "aminopropyl(triethoxy)silane" in the table on page 9 as having a particle size of 2 nm with an endnote stating the "material is likely molecular or oligomeric in nature". Applicants do not set forth how said particle size was arrived, e.g., the dispersing media, the type of measurement, or calculation to determine said particle size. Without said description, it is unclear how one skilled in the art would interpret "amount sufficient, and only sufficient, to cover the core particles".

Claim interpretation

7. The following claims 28 is representative of the claimed subject matter:

28. A colloidal aqueous dispersion comprising core-shell particles dispersed in an aqueous medium, wherein said aqueous dispersion has a percent solids of greater than 5 weight percent; wherein the solid consists of core-shell particles wherein the surface of said core-shell particles comprises a particulate material and the particulate material is present in an amount sufficient, and only sufficient, to cover the surfaces of all core particles, and the ratio of the average particle diameter of the core particles to the average particle diameter of the particulate material is greater than 4 and wherein said core-shell particle has a zeta potential of greater than ± 30 millivolts.

The limitation of "an amount sufficient, and only sufficient, to cover the surfaces of all core particles" is interpreted as an amount to cover at least part of all particles without further free shell particles in the sol. The "ratio of the average particle diameter of the core particles to the average particle diameter of the particulate material is greater than 4" has been interpreted to include the molecular size of the shell materials. This is based on applicants' characterization (page 5, lines 17-19, of the instant specification)

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of shell materials, which include non-particulate materials and (pages 9 to 10, lines penultimate line to line 1) the characterization of non-particulate aminopropyltriethoxysilane as a molecular or oligomeric in nature.

Regarding the ratio of the average particle size of the core particles (Avg core) to the average particle diameter of the shelling particulate material (Avg shell) of greater than 4, equates to Avg core / Avg shell. It is readily apparent that as the shelling particulate material reading on molecular size (see preceding paragraph) approaches zero, e.g., molecular sizes, the resulting ratio increases and approaches infinite.

The claims are directed to compositions with limitations defining the precursor materials that form the compositions. To the extent said precursor materials impart patentability to the final composition, coating has not been further defined other than the zeta potential. Attention is directed to MPEP 2112 and 2112.01.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

11. Claims 28-34 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Alexander et al, 3,007,878. Alexander et al (column 1, lines 11 et seq; column 3, lines 1 et seq, particularly lines 18-19; column 5, lines 6-9; column 7, lines 3-21; examples; and claims) disclose silica hydrosols coated with either alumina or zirconia.

Alexander et al (column 3, lines 1 et seq) discloses the use of silica sols having a particle size of about 5 to 150 millimicrons (1 millimicron = 1 nanometer = 1 nm) and (example 1) employs LUDOX LS colloidal silica at a 30 % by weight solids and a particle size of about 10-12 nm.

Alexander et al (column 5, lines 6-9) further disclose the sol products after mixing are purified by dialysis to remove excess electrolytes and may then be further concentrated.

Alexander et al (columns 6 to 7, lines 65 to 21 and examples 4-5) further disclose positive sols of silica coated with zirconia including those having a zirconia molar content of 50 to 99 %.

Alexander et al discloses ZrO_2 coated silica sols. Said sol particles would have inherently had a zeta potential of ± 30 millivolts as a result of the fully coated ZrO_2 groups on the surface of the silica.

To the extent Alexander et al differs from the claims in the concentration of the ZrO_2 or Al_2O_3 coating to make the particles positive or the final zeta potential of the particular sols, it would have been obvious to one of ordinary skilled in the art at the time of applicants' invention to vary the concentrations of the coating materials to make the advantageous positive sols taught in the Alexander et al reference.

Alexander et al (column 7, lines 3 et seq) teaches high ZrO_2 colloidal ZrSiO_4 were known at the time of applicants' invention for the advantage of making zircon ceramics. It would have been obvious to one of ordinary skilled in the art at the time of applicants' invention to completely coat the silica for the advantageous purpose of making zircon. Said coated particles having a high concentration of ZrO_2 would have necessarily resulted in a high zeta potential as claimed.

Furthermore, any excess coating material would have been removed by the dialysis purification step clearly taught and contemplated in the Alexander et al reference.

12. Claims 28-34 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Field et al, US 6,420,039, optionally in view of Erickson, US 6,080,216.

Field et al (Figure 1; column 2, lines 12 et seq ; column 4, lines 43 et seq ; column 6, lines 10 et seq, particularly column 7, lines 18 et seq ; and example 1, particularly column 17, lines 20 et seq) discloses treatment of silica with basic aluminum chloride (aluminum chlorohydrate) under high shear mixing conditions. Said treatment results in core-shell sol particles with a zeta potential of about 30 mV. Field et al (example 1) discloses the initial concentration of the silica is 10 % by weight, which necessarily increases to greater than 10 % by weight solids content upon the addition and reaction of the basic aluminum chloride to said 10 % by weight silica sol.

Regarding the ratio of the average particle size of the core particles (Avg core) to the average particle diameter of the shelling particulate material (Avg shell) of greater than 4, equates to Avg core / Avg shell. It is readily apparent that as the shelling particulate material reading on molecular size (see claim interpretation above) approaches zero, e.g., molecular sizes, the resulting ratio increases and approaches infinite, which is greater than 4.

To the extent the Field et al reference differs from the claims in the particulate ratio, Erickson (column 13, lines 61 et seq) teaches the alumina precursor sols can be made by diluting or concentrating a solution of a basic aluminum salt.

Since the silica particle size are expected to be in excess and the basic aluminum salt sols and solutions, the particle size ratio of the silica to the aluminum salts would have been expected to be in excess of at least 4.

13. Claims 28-35 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Bolt, US 5,650,002, optionally in view of Field et al, US 6,420,039. Bolt (examples and claims) discloses the combination of core particles of TiO_2 and SiO_2 further coated with sodium silicate followed by further coating with sodium aluminate and an adjustment of the pH to about 6. Said materials would have inherently resulted in a positive alumina coated sol having a positive zeta potential.

Regarding the ratio of the average particle size of the core particles (Avg core) to the average particle diameter of the shelling particulate material (Avg shell) of greater than 4, equates to Avg core / Avg shell. It is readily apparent that as the shelling particulate material reading on molecular size (see claim interpretation above) approaches zero, e.g., molecular sizes, the resulting ratio increases and approaches infinite, which is greater than 4.

To the extent that Bolt differs from the claims in the zeta potential, Field et al (Figure 1 and examples) discloses the formation of stable dispersions of alumina coated silica particles in an acidic pH of zeta potential of about 30 mV. Bolt examples also

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disclose alumina coated particles in an acidic pH. Field et al is evidence that the particles of Bolt when in suspension would have resulted in a zeta potential of about 30 mV. These references are combinable since they teach fillers and pigment particles having an alumina coated surface. Field et al (column 14, lines 41; to column 15, lines 67) teaches providing stable suspensions by employing an acidic pH and removal of electrolytes. It would have been obvious to one of ordinary skill in the art at the time of applicants' invention to employ the requisite alumina and purify the particles of Bolt to advantageously provide a stable suspension for use in coating compositions.

Double Patenting

14. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

15. Claims 28-35 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-17 of

compending Application No. 11/036,814. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims substantially overlap. The specific limitations in the instant claims that the '814 claims are generic, are disclosed in the '814 disclosure. The only logical conclusion is that the '814 claims include compositions having said limitations of the instant claims. The instant claims otherwise encompass the compending '814 claims.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.


Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel S. Metzmaier whose telephone number is (571) 272-1089. The examiner can normally be reached on 9:00 AM to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy P. Gulakowski can be reached on (571) 272-1302. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Daniel S. Metzmaier
Primary Examiner
Art Unit 1712

DSM